

REMARKS

The Amendment:

Claim 1 has been amended in response to the examiner's comments in the final rejection to the effect that the claims were not commensurate with applicants' arguments that the indicia array constituted a "direct image" array. The limitation that the array is a direct-image array was inherent in the preamble limitations that the transfer is a "two-stage" transfer and that the transfer is to be applied to the inside surface of a rotational mold. Although these limitations are in the preamble of the claim, they are significant where, as here, they clarify succeeding limitations. Nevertheless, applicants have also adapted the language suggested by the examiner to avoid any ambiguities.

Claim 1 has also been amended to be commensurate with applicants' arguments concerning the need to eliminate the lacquer layer of the Makar et al transfer by substitution of the expression "consisting essentially of" for "comprising" in accordance with accepted claim interpretation. Again, it is believed that the claim previous to the amendment excluded constituents other than those enumerated in the claims since the exclusionary phrase appeared in lines 4-5 of the claim, and the amendment is proposed to avoid any ambiguities.

The Rejection:

Claims 1, 2, 6-8 and 16-19 were rejected under 35 USC §103 as considered to be obvious over [Makar] et al (5,908,694). In the examiner's arguments, reliance is also placed on Noguchi (relevant to all claims) and Hiatt (with regard to claims 18 and 19). Accordingly, applicants will treat the prior art rejections as follows:

Claims 1, 2, 6-8, 16 and 17 were rejected under 35 USC §103 as considered to be obvious over Makar et al (5908694), alone, or in view of Noguchi.

Claims 18 and 19 as rejected under 35 USC §103 as considered to be obvious over Makar et al (5908694), alone, or in view of Noguchi, in further view of Hiatt et al.

This Request for Reconsideration:

The examiner's withdrawal of the rejection of the claims as indefinite under 35 U.S.C. § 112 is noted with appreciation.

Applicants request reconsideration of the final rejection in view of the following arguments and the data submitted by the accompanying declaration by coinventor R. Allan Reeves.

The Prior Art

Makar et al discloses a single stage transfer which must have an indicia array as a mirror image, which is useful for labeling preformed polyethylene containers. Makar et al disclose two embodiments, one that is useful for application to polyethylene containers which have pretreated, oxidized surfaces to receive the label and a second embodiment (FIG. 2) for application to an untreated polyethylene containers. Since applicants' invention does not apply to pretreated, oxidized surfaces, the following discussion and arguments are directed to the FIG 2 embodiment.

Makar et al provide a transfer which has three major layers or coats applied to a carrier sheet.. These are:

- (1) a protective lacquer coat 123, that is formed of VITEL 2300, a cross-linked polyester resin;
- (2) an ink design layer preferably comprising an acrylic ink (column 11, lines 41-42); and
- (3) a heat activated adhesive "top" coat 127 which is the same as coat 27 of FIG. 1, a particularly preferred example is shown in the table at column 9, lines 7-15, as a mixture of a polyamide resin, ethylene vinyl acetate resin, and chlorinated polyethylene solution.

Noguchi et al contains a disclosure that ink jet printing on paper includes solvent inks which contain a dye and a "solid component like a wax and a polymeric

component". The purpose of including wax in the ink composition is to prevent running and strike through of the ink, which is described as occurring when an organic solvent ink permeates too rapidly into the paper substrate; see column 2, lines 4-6.

Hiatt et al discloses a heat transfer label which is very similar to that shown by Makar et al with an improved transfer release layer which is not carried with the label onto the container. Hiatt et al state that the prior art has suggested the use of a polyester film as a transfer carrier.

Applicants Arguments

Testing And Results:

Applicants have submitted a declaration by R. Alan Reeves, a coinventor, describing comparative tests which he made with a transfer he prepared with the ink, lacquer and adhesive layers which are the most preferred embodiments of Makar et al for untreated polyethylene bottles and a transfer prepared in accordance with this invention. The transfer was applied to a carrier film that was coated with a wax release layer. The Makar et al transfer was prepared with the lacquer composition described in column 7, lines 25-32 of the Makar et al patent; the acrylic ink, and the adhesive composition described in the table in column 9 of the Makar et al patent. Each layer was dried before application of the next succeeding layer, as described by Makar et al.

Mr. Reeves also prepared a transfer in accordance with the teachings of this application, using a carrier sheet coated with the same wax release layer as used in preparing the Makar et al transfer. He coated the carrier sheet with an ink layer that was formed with a composition of 11 percent carbon black and 89 percent microcrystalline wax, dried the layer and then applied a heat sensitive coating formed of an adhesive which is non-adhesive at ambient temperature but adhesive at elevated temperatures, using a composition of a hydrocarbon resin in a hydrocarbon solvent.

He applied both transfers to separate portions of the inside surface of the rotational mold which he had heated to a typical rotational molding demolding temperature (150 degrees F.). Both transfers separated from the carrier sheet and adhered to the inside surface of the mold. He then added the polyethylene molding resin, closed the mold and placed it on a rotational molding machine and heated the mold to 554 degrees F. while rotating about its major and minor axes for 12 minutes. After the mold was cooled and opened, he cooled the mold, opened the mold and inspected the molded part and the inside surface of the mold.

The Makar et al transfer did not melt in the mold and left a black residue on the surface of the mold. Only a portion of the transfer appeared on the molded part as an applique, slightly raised above the surrounding surface of the molded part. The transferred portion was not permanently secured to the molded article. This was evident when Mr. Reeves applied a pressure sensitive tape over the transfer portion and peeled the tape back, lifting the entire area of the transfer which was beneath the tape.

In contrast, the transfer prepared in accordance with this invention melted entirely during the molding operation and separated cleanly from the inside wall of the mold, leaving no residue. The transfer fused into the surface of the molded part with a smooth polished surface that was flush with the surrounding polyethylene surface. When Mr. Reeves applied a pressure sensitive tape over the transfer and peeled the tape back, the tape separated cleanly and none of the transfer was lifted from the polyethylene part.

The results achieved by applicants' invention are extraordinary. A single transfer is achieved which bonds to the inside wall of a mold and releases from the carrier sheet at the demolding temperature (about 150 degrees F.) and melts and fuses into the wall of the molded part at the molding temperature (about 500 degrees F.). Such results can not be achieved by any obvious modifications of the Makar et al transfer.

The examiner has suggested that: "selecting a heat-activatable adhesive layer with suitable melting temperature is either inherently disclosed or an obvious optimization to one of ordinary skill in the art."

The Makar et al transfer can not be modified to the presently claimed invention simply by the selection of a suitable heat-activatable adhesive layer. First, one must print the transfer indicia as a direct, rather than a mirror, image. Second, one must eliminate the protective lacquer layer from the Makar et al transfer. Third, one must substitute the thermosetting adhesive used by Makar et al with a thermoplastic adhesive which is non-adhesive at ambient temperature, adhesive at demolding temperature, and which will melt and fuse into the wall of the molded product.

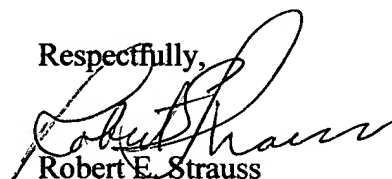
Where is the prior art which suggests all these changes? The examiner has cited only Noguchi's ink as suggesting the use of an ink which contains hydrocarbon wax and advances the argument that such a use is obvious to "prevent running of the ink." Where is the prior art that suggests that "running of the ink" is a problem which is encountered when applying a transfer to a hot mold surface, or for that matter when applying a transfer to any surface? That problem may be present in ink jet printing as suggested by Noguchi, but it is not present in applicants' invention, nor is there any prior art which suggests that running of the ink layer is a problem with transfer labels such as shown by Makar et al. In fact, it is doubtful that one skilled in the art would ever consider the teachings of Noguchi et al, particularly since the ink layer is not applied directly onto paper, but instead is applied to a carrier which is coated with a release layer. Thus, the problem which faced Noguchi, i.e., an organic solvent ink permeating too rapidly into a paper substrate could not even occur when printing the transfer labels of Makar et al or of applicants where the carrier sheet is coated with a release layer. Accordingly, it is not obvious to substitute a wax containing ink for the acrylic ink used by Makar et al to prepare any transfer that is prepared by printing on a release coated paper..

It is clear that the only source of suggestions to prepare a transfer with a direct image formed with a wax ink and an adhesive layer, all of which will melt at the molding temperature, and without a protective lacquer layer is applicants' disclosure. Of course, it is improper to use an applicant's teachings as suggestions to modify the prior art.

Claims 18 and 19 are similarly without suggestion by the prior art. Although Hiatt et al disclose that the prior art has used polyester films there clearly is no prior art suggesting that it would be obvious to use a wax ink layer with a polyester carrier sheet, since Noguchi et al disclose that wax containing ink is useful to prevent ink running on paper, not on a polyester film.

The claims are believed to be in proper form and, for the reasons set forth herein, define invention over the prior art. Reconsideration of the final rejection and allowance is respectfully requested. In the event that the examiner maintains the final rejection, it is requested that the amendment be entered for purposes of appeal as it obviates the issue that the claims are not commensurate with the arguments which applicants have previously advanced in this application.

Respectfully,



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